

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-3, 7-13 and 15-29 are presently active in this case. The present Amendment cancels Claim 8 without prejudice or disclaimer.

In the outstanding Office Action, Claim 8 was rejected under 37 C.F.R. §1.75(c) as of improper dependent form for failing to further limit the subject matter of a previous claim; Claims 1-2, 7-13 and 15-29 were rejected under 35 U.S.C. §103(a) as unpatentable over Kamon (U.S. Patent No. 5,920,646) in view of Accad (U.S. Patent No. 5,553,200) and Miyakawa (U.S. Patent No. 5,084,762); Claim 3 was rejected under 35 U.S.C. §103(a) as unpatentable over Kamon, Accad, and Miyakawa, and in further view of Hong (U.S. Patent No. 5,457,546).

In response to the rejection of Claim 8 under 37 C.F.R. §1.75(c), Claim 8 is cancelled without prejudice or disclaimer.

In response to the rejection of Claims 1-2, 7-13 and 15-29 under 35 U.S.C. §103(a), Applicant respectfully requests reconsideration of this rejection and traverses the rejection, as discussed next.

Briefly recapitulating, Applicant's Claim 1 relates to an image forming apparatus, including: a print engine forming a visible image by image data supplied thereto; a controller receiving original image data from an external image-data source and supplying the image data to said print engine; and a smoothing unit provided between said controller, and said print engine. The smoothing unit includes, *inter alia*: a binary process unit configured to binarize the original image data; a smoothing process unit configured to selectively apply the smoothing process to the original image data to output a smoothed image data; and a selector

configured to select one of the original image data received by the controller and one of the smoothed image data based on the selection signal.

As explained in Applicant's specification at page 7, lines 16-25, Claim 1 improves upon conventional smoothing processes in image forming apparatuses by preventing a gradation in an image represented by multiple value image data from being deteriorated by an unnecessary smoothing process.

Turning now to the applied references, Kamon discloses a digital copying machine capable of forming a superior quality image even by *merely using a binary image*, and thereby reducing the amount of required memory.¹ Kamon further explains that the capacity of memory can be reduced, since the original image signal read by an image unit is binarized by a binary gradation processing unit.² However, Kamon fails to teach or suggest a selector configured *to select one of the original image data received by the controller* and one of the smoothed image data based on the selection signal, and also fails to teach or suggest a smoothing process unit configured to selectively *apply the smoothing process to the original image data*. As explained in Kamon at column 11, lines 23-32, "the pattern recognition unit 105 utilizes a pattern recognition technique to determine from binary image data ... whether or not each pixel requires a jagged line correction." Accordingly, selecting binarized image data from a pattern memory 106, multi-value filter 107, or FF/00 converter 108, as taught by Kamon, *is not* the selecting of original image data received by the controller, as claimed by Applicant. Furthermore, a multi-value processing unit processing binarized image data, as taught by Kamon, *is not* a smoothing process unit configured to selectively *apply the smoothing process to the original image data*. As explained in Kamon, the binarized data is converted back to a multiple value image data,³ but thereby it is not possible to restore the

¹ See Kamon in the title of the invention and at column 4, lines 30-35.

² See Kamon in the Abstract.

³ See Kamon for example at column 10, lines 19-30.

original image. In Applicant's invention, a portion of the image data supplied to the print engine includes a portion of the original image data, and the portion of the original image data *is not processed by the smoothing unit*. For example, if the original image data is a color image,⁴ the binarized version of the original image data cannot maintain the hue data of the color image. Furthermore, if the original image data would contain character data or picture data, by using the conversion process disclosed in Kamon, halftone image data would also be converted to binary image data.

The outstanding Office Action confirms that Kamon's data supplied to the selector 110 is not the original image data by reciting that a different "format [is] used for the electronic representation of the image data."⁵ However Applicant respectfully disagrees with the outstanding Office Action in the same passage that this is the only difference between Kamon's original image data and converted image data. In Kamon, the γ correction circuit 18 delivers image data to either the binary gradation processing unit 192 or to the multi-value gradation processing unit 191.⁶ In other words, and as explained in Kamon at column 10, lines 31-65, the data outputted from the binary gradation processing unit 192 or the multi-value gradation processing unit 191 is binary data, and therefore is not the original data anymore. Kamon's FF/00 converter can merely convert the binary data back to a 10-bit data format,⁷ and therefore *does not* restore the original data.

Applicant further respectfully submits that the other references Accad and Miyakawa, used by the outstanding Office Action to form the 35 U.S.C. §103(a), do not remedy the deficiencies of Kamon. Accad describes a method for providing a bit-rate reduction to transform 32-bit CMYK image data to 16 bit code image data, by using a look-up-table,

⁴ See Applicant's Claim 1, line 20.

⁵ See the outstanding Office Action at page 5, lines 10-13.

⁶ See Kamon in Figure 3 and at column 10, lines 56-65.

⁷ See Kamon at column 10, lines 55-67.

thereby obtaining a transformed image.⁸ However, Accad is entirely silent on the selecting of original image data received by the controller, and is also silent on a smoothing process unit configured to selectively apply the smoothing process to the original image data. The reference Miyakawa describes a method for obtaining a black-printer amount and an under-color amount to be removed in order to reproduce colors.⁹ Miyakawa applies the color image conversion to all the components C, M, Y and K.¹⁰ Accordingly, Miyakawa also fails to teach or suggest the selecting of original image data received by the controller, and is also silent on a smoothing process unit configured to selectively apply the smoothing process to the original image data, as recited in Claim 1.

Therefore, even if the combination of Kamon and Accad and/or Miyakawa is assumed to be proper, the combination fails to teach every element of the claimed invention. Accordingly, Applicant respectfully traverses, and requests reconsideration of, this rejection based on these patents.¹¹

Applicant further respectfully submits that Miyakawa fails to teach or suggest that a threshold value is set lower with respect to black, than a threshold value of other colors, as recited in Applicant's claim 1. Miyakawa describes a transformation function $f(M_{in})$, wherein the black print amount KS is calculated by the transformation function $f(M_{in})$.¹² KS depends therefore on the color components C, M and Y, and is calculated to be in accordance with the minimal value among the three primary color components C, M and Y.¹³ Accordingly, a transformation function $f(M_{in})$ depending on the minimal value among the three primary

⁸ See Accad in the Abstract.

⁹ See Miyakawa in the Abstract.

¹⁰ See Miyakawa in Figure 2.

¹¹ See MPEP 2142 stating, as one of the three "basic criteria [that] must be met" in order to establish a *prima facie* case of obviousness, that "the prior art reference (or references when combined) must teach or suggest all the claim limitations," (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

¹² See Miyakawa at column 2, lines 46-52.

¹³ See Miyakawa at column 3, lines 3-9.

color components C, M and Y, as taught by Miyakawa, is not a threshold value that is set lower with respect to black than a threshold value of other colors, as recited in Claim 1. In Miyakawa, there is no thresholding. The references Kamon and Accad do not remedy the deficiencies of Miyakawa, since both references are silent on the above feature.

Independent Claim 26 recites limitations analogous to the limitations recited in independent Claim 1. Accordingly, for the reasons stated above for the patentability of Claim 1, Applicant respectfully submits that the rejections of Claim 26, and all associated dependent claims, are also believed to be overcome in view of the arguments regarding independent Claim 1.

In response to the rejection of Claim 3 under 35 U.S.C. §103(a), since independent Claim 1 is believed to be allowable, dependent Claim 3 is also believed to be allowable. In addition, even if we assume that the combination of these references is proper, the applied reference Hong does not remedy the deficiencies of the other references Kamon, Accad and Miyakawa. Accordingly, Applicant respectfully submits that the obviousness-type rejection of Claim 3 is believed to be overcome.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-3, 7-13 and 15-29 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

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